

## Claims

What is claimed is:

1. In a graphical user interface of a signal measurement system, a system  
5 for enabling a user to position the signal measurement system's sample position within a data valid window by enabling direct graphical manipulation of sample positions relative to an actual data valid window on a device under test.
2. The system of claim 1, wherein:  
the signal measurement system is a logic analyzer.
- 10 3. The system of claim 1, wherein:  
the data valid window is a stable and transitioning regions data display.
4. The system of claim 3, wherein:  
direct graphical manipulation of sample positions is made in 100 ps  
increments.
- 15 5. The system of claim 3, wherein:  
direct graphical manipulation of sample positions is made in increments less than 100 ps.
6. The system of claim 1, wherein the data valid window is automatically discovered on all channels.
- 20 7. The system of claim 5, wherein the data valid window defines the stable data valid regions and transitioning regions for each signal relative to a clock transition.
8. The system of claim 7, wherein the data valid window is displayed as a bus composite view.

9. The system of claim 8, wherein the composite view defines the union of all transitioning regions and the intersection of all stable regions of all signals of the represented bus.

10. The system of claim 8, wherein a sample position marker indicating the  
5 range of sample positions for the represented bus is displayed.

11. The system of claim 10, wherein the graphical user interface further displays a plurality of information and control items.

12. The system of claim 11, wherein the plurality of information and control items comprises:

- 10
- a) a bus/signal label;
  - b) a sample position time scale;
  - c) a plurality of information icons;
  - d) a plurality of time stamp icons;
  - e) a graphical representation of a suggested sample position;
  - 15 f) a text display of the selected sample position;
  - g) a plurality of sample position scroll buttons; and
  - h) a legend.

13. The system of claim 12, wherein graphical selection of a stable region or a transitioning region causes a popup menu to be displayed.

20 14. The system of claim 13, wherein the popup menu comprises a list of graphically selectable options.

15. The system of claim 14, wherein said graphically selectable options comprise:

- a) expand;
- b) collapse;
- c) view as bus composite;
- d) view as stack of channels;
- 5 e) set sampling position to suggested;
- f) show message; and
- g) show time stamp.

16. The system of claim 8, wherein said composite view is expandable.

17. The system of claim 7, wherein the data valid window is displayed as an  
10 individual channels view with each channel displayed individually.

18. The system of claim 17, wherein the graphical user interface further  
displays a plurality of information and control items.

19. The system of claim 18, wherein said plurality of information and control  
items comprises:

- 15 a) a bus/signal label;
- b) a sample position time scale;
- c) a plurality of information icons;
- d) a plurality of time stamp icons;
- e) a graphical representation of a suggested sample position;
- 20 f) a plurality of text display of the selected sample position;
- g) a plurality of sample position scroll buttons associated with said  
plurality of text displays; and
- h) a legend.



29. The system of claim 28, wherein said first indicator indicates a sampling position identified by the signal measurement system as the optimal sampling position for the selected stable region.

30. The system of claim 29, wherein said second indicator is graphically selectable and indicates a sampling position selected by the user.

31. The system of claim 30, wherein selection and motion of said second indicator causes said selected sampling position to change.

32. The system of claim 31, wherein said plurality of sample position scroll buttons are graphically selectable and selection of one of said buttons causes a corresponding selected sampling position to change.

33. The system of claim 17, wherein the individual channels view displays the width of the stable regions and the width of the transitioning regions for each individual channel.

34. The system of claim 17, wherein the individual channels view is collapsible.

35. In a graphical user interface of a signal measurement system, a system for enabling a user to position the signal measurement system's sample position within a data valid window by enabling direct graphical positioning of sample positions relative to an actual data valid window on a device under test, wherein;

- a) the signal measurement system is a logic analyzer;
- b) the data valid window is a stable and transitioning regions data display;
- c) the data valid window is automatically discovered on all channels;

d) the data valid window is displayed as an individual channels view with each channel displayed individually;

e) the graphical user interface further displays a plurality of information and control items;

5 f) said plurality of time stamp icons are graphically selectable;

g) two distinct sampling positions indicators are displayed in each of said channels;

h) a first of said two distinct sampling positions indicators represents a suggested sampling position and a second of said two distinct sampling positions  
10 represents a selected sampling position;

i) said first indicator indicates a sampling position identified by the signal measurement system as the optimal sampling position and said second indicator is graphically selectable and indicates a sampling position selected by the user; and

15 j) selection of said second indicator causes said selected sampling position to change.

36. The system of claim 35, wherein graphical selection of a stable region or a transitioning region causes a text message to be displayed on said graphical user interface.

20 37. The system of claim 36, wherein the pop-menu comprises a list of graphically selectable options.

38. The system of claim 37, wherein said graphically selectable options comprise:

- a) expand;
- b) collapse;
- c) view as bus composite;
- d) view as stack of channels;
- 5 e) set sampling position to suggested; and
- f) show message; and
- g) show time stamp.

39. The system of claim 35, wherein said plurality of information and control items comprises:

- 10 1) a bus/signal label;
- 2) a sample position time scale;
- 3) a plurality of information icons;
- 4) a plurality of time stamp icons;
- 5) a graphical representation of a suggested sample position;
- 15 6) a plurality of text display of the selected sample position;
- 7) a plurality of sample position scroll buttons associated with said plurality of text displays; and
- 8) a legend;

40. In a graphical user interface of a signal measurement system, a method  
20 for enabling a user to position the signal measurement system's sample position within a data valid window by enabling direct graphical positioning of sample positions relative to an actual data valid window on a device under test, comprising the steps of:

a) automatically discovering the data valid windows on all channels;  
b) displaying the data valid window as an individual channels view  
with each channel displayed individually;

c) displaying stable and transitioning regions in said data valid  
5 window;

d) displaying two distinct sampling positions indicators in each of said  
channels, wherein a first of said two distinct sampling positions indicators  
represents a suggested sampling position and a second of said two distinct  
sampling positions indicators represents a selected sampling position; and

10 e) modifying the sampling position of said signal measurement system  
in response to graphical movement of said second indicator.

41. The method of claim 40, further comprising the step of displaying a  
plurality of information and control items.

42. The method of claim 41, wherein said plurality of information and control  
15 items comprises:

- 1) a bus/signal label;
- 2) a sample position time scale;
- 3) a plurality of information icons;
- 4) a plurality of time stamp icons;
- 20 5) a graphical representation of a suggested sample position;
- 6) a text display of the selected sample position;
- 7) a plurality of sample position scroll buttons; and
- 8) a legend.



43. The method of claim 42, wherein said plurality of information icons are graphically selectable.

44. The method of claim 43, further comprising the step of selecting one of said plurality of information icons causing a text message to be displayed on said graphical user interface.

45. The method of claim 44, wherein said text message is displayed in a message fly-out format.

46. The method of claim 45, graphically selecting one of said plurality of time stamp icons causing a text message to be displayed on said graphical user interface.

47. The method of claim 46, wherein said time stamp icon text message is displayed in a message fly-out format.

48. The method of claim 40, further comprising the step of graphically selecting one of said stable regions or one of said transitioning regions, causing a pop-up menu to be displayed on said graphical user interface.

49. The method of claim 48, wherein said pop-up menu comprises a list of options including at least:

- 1) expand;
- 2) collapse;
- 3) view as bus composite;
- 4) view as stack of channels;
- 5) set sampling position to suggested; and
- 6) show message; and

7) show time stamp.

50. The method of claim 49, further comprising the step of graphically selecting the "collapse" option from said pop-up menu causing said individual channels view to collapse into a composite bus view.

5 51. The method of claim 50, wherein said composite view defines the absolute largest transitioning region and the absolute smallest stable region of all signals of the represented bus.

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